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Paolo Fella

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09/24/2009

Kirschstein, Israel, Schiffmiller & Pieroni, P.C.

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EXAMINER

DOBSON, DANIEL G

ART UNIT

PAPER NUMBER

2613

NOTIFICATION DATE

DELIVERY MODE

09/24/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/533,226	Applicant(s) FELLA ET AL.	
	Examiner DANIEL G. DOBSON	Art Unit 2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 July 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 1-20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments, filed 07/24/2009, with respect to claims 21 and 30 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Printed Publication "All Optical Gain-Clamping in Erbium-Doped Fiber Amplifier Using Stimulated Brillouin Scattering" to Lee et al.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 21, 25, 29, 30, 34, and 38-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Printed Publication "All Optical Gain-Clamping in Erbium-Doped Fiber Amplifier Using Stimulated Brillouin Scattering" to Lee et al.

As to **Claim 21**, Lee discloses an apparatus for controlling optical amplifier gain (Fig. 1), comprising:

- a) a source for generating a gain control signal (Fig. 1, probe LD);
- b) an optical amplifier for receiving at least one of optical input signal channels at a first end (Fig. 1, 2 stage EDFA, with input designated by "signal in");

c) a coupler for providing the gain control signal to the optical amplifier at a second end thereof (Fig. 1, coupler connected to probe LD at output end of EDFA); and

d) the source being arranged to generate the gain control signal at a power level that produces stimulated Brillouin scattering in the optical amplifier (p. 1317, Col. 1, probe beam stimulates SBS which reenters the second stage of the amplifier), wherein the gain control signal is at a higher wavelength than any of the optical input signal channels (p. 1316, Col. 2, probe is at 1559 nm; p. 1317, Col 1, signals range 1549 to 1554.94 nm.)

As to **Claim 25**, *Lee* discloses wherein the gain control signal falls within a gain bandwidth of the optical amplifier (p. 1317, Col. 1, probe signal experiences gain.)

As to **Claim 29**, *Lee* discloses wherein the amplifier is a rare earth doped fiber amplifier (Fig. 1, two stage EDFA.)

As to **Claim 30**, *Lee* discloses method of controlling optical amplifier gain (Fig. 1), comprising the steps of:

a) introducing at least one of optical input signal channels into a first end of an optical amplifier (Fig. 1, 2 stage EDFA, with input designated by "signal in");

b) generating a gain control signal and introducing the gain control signal at a second end of the optical amplifier (Fig. 1, coupler connected to probe LD at output end of EDFA); and

c) generating the gain control signal at a power level that produces stimulated Brillouin scattering in the optical amplifier (p. 1317, Col. 1, probe beam stimulates SBS which reenters the second stage of the amplifier), wherein the gain control signal is at a higher wavelength than any of the optical input signal channels (p. 1316, Col. 2, probe is at 1559 nm; p. 1317, Col 1, signals range 1549 to 1554.94 nm.)

As to **Claim 34**, *Lee* discloses wherein the gain control signal falls within a gain bandwidth of the optical amplifier (p. 1317, Col. 1, probe signal experiences gain.)

As to **Claim 38**, *Lee* discloses wherein the amplifier is a rare earth doped fiber amplifier (Fig. 1, two stage EDFA.)

As to **Claim 39**, *Lee* discloses wherein the wavelength of tile gain control signal is around 10 to 15 nm higher than any of tile optical input signal channels (1559-1549= 10 nm in the case where input signals is 1 (n=1.))

As to **Claim 40**, *Lee* discloses wherein the wavelength of tile gain control signal is around 10 to 15 nm higher than any of tile optical input signal channels (1559-1549= 10 nm in the case where input signals is 1 (n=1.))

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 22, 23, 27, 31, 32, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Printed Publication "All Optical Gain-Clamping in Erbium-Doped Fiber Amplifier Using Stimulated Brillouin Scattering" to Lee et al. and U.S. Patent Application Publication 2002/0196527 A1 to Veith.

As to **Claim 22**, *Veith* discloses a controller for identifying a change in an input signal and for varying the power level of the gain control signal to compensate for the identified change (¶¶ 39, 24-25, the intensity of the pump light is controlled via a closed loop control circuit to obtain the desired amplification.)

Lee and *Veith* are from the same art with respect to optical communication, and are therefore analogous art.

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to use a control loop to control the gain control signal in the system disclosed by *Lee*. The suggestion/motivation comes from *Lee*, in that the probe beam power is the key parameter to be optimized.

As to **Claim 23**, *Veith* discloses monitor means for monitoring a power of the input signal and for varying the power level of the gain control circuit to compensate for changes in the monitored power (¶¶ 39, 24-25, the intensity of the pump light is controlled via a closed loop control circuit to obtain the desired amplification.) The suggestion/motivation is the same as that used in the rejection for claim 22.

As to **Claim 27**, *Veith* discloses wherein the amplifier is a Raman amplifier (¶¶ 38-40.)

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to apply the method disclosed by *Lee* for improving an EDFA to the Raman amplifier disclosed by *Veith*. The modification would have been made with known methods and with predictable results.

As to **Claim 31**, *Veith* discloses a controller for identifying a change in an input signal and for varying the power level of the gain control signal to compensate for the identified change (¶¶ 39, 24-25, the intensity of the pump light is controlled via a closed loop control circuit to obtain the desired amplification.)

Lee and *Veith* are from the same art with respect to optical communication, and are therefore analogous art.

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to use a control loop to control the gain control signal in the system disclosed by *Lee*. The suggestion/motivation comes from *Lee*, in that the probe beam power is the key parameter to be optimized.

As to **Claim 32**, *Veith* discloses monitor means for monitoring a power of the input signal and for varying the power level of the gain control circuit to compensate for changes in the monitored power (¶¶ 39, 24-25, the intensity of the pump light is controlled via a closed loop control circuit to obtain the desired

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amplification.) The suggestion/motivation is the same as that used in the rejection for claim 22.

As to **Claim 36**, *Veith* discloses wherein the amplifier is a Raman amplifier (¶¶ 38-40.)

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to apply the method disclosed by *Lee* for improving an EDFA to the Raman amplifier disclosed by *Veith*. The modification would have been made with known methods and with predictable results.

6. Claims 24, 24, 33 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Printed Publication "All Optical Gain-Clamping in Erbium-Doped Fiber Amplifier Using Stimulated Brillouin Scattering" to Lee et al. and U.S. Patent 5,598,289 to Watanabe.

As to **Claims 24 and 33**, *Watanabe* discloses obtaining information at the at least one input signal channel from and optical supervisory channel (Col. 10, ll. 50-8.)

Watanabe and *Lee* are from the same art with respect to optical communications, and are therefore analogous art.

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to use a supervisory channel to obtain information about input signal channels in the system disclosed by *Veith*. The suggestion/motivation would have been to quickly detect points of trouble or other interference in the transmission system.

As to **Claims 26 and 35**, *Watanabe* discloses means for monitoring the power level of the gain control signal (Fig. 28, 196, 199.)

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to monitor the gain control signal (SBS injection light) in the system disclosed by *Lee*. The suggestion/motivation would have been to be able to quickly diagnose a failure by the pump.

7. Claims 28 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Printed Publication "All Optical Gain-Clamping in Erbium-Doped Fiber Amplifier Using Stimulated Brillouin Scattering" to Lee et al. and U.S. Patent 6,441,950 B1 to Chen et al.

As to **Claims 28 and 37**, *Chen* discloses that distributed Raman amplifiers and rare earth doped amplifiers are commonly used in communications systems (background and summary of the invention.)

Chen is from the same art with respect to optical communications, and is therefore analogous art.

At the time of the invention, it would have been obvious for a person of ordinary skill in the art to use a distributed Raman amplifier and/or a rare earth doped fiber amplifier in the system disclosed by *Veith*. The suggestion/motivation would have been to use available parts and well established technology.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DANIEL G. DOBSON whose telephone number is (571)272-9781. The examiner can normally be reached on Mon. - Fri. 8:00 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Daniel G. Dobson/
Examiner, Art Unit 2613
09/18/2009

/Kenneth N Vanderpuye/

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Supervisory Patent Examiner, Art Unit 2613